Illinois Department of Transportation

Memorandum

To:	Regional Engineers	Attn:	Project Implementation and Program Development Engineers
From:	D. Carl Puzey		
Subject:	Shop Drawing Procedures		
Date:	May 16, 2016		

Attached are instructions and updated submittal and distribution flowcharts for state projects requiring fabrication shop drawing review by either a consultant or the Bureau of Bridges and Structures (BBS). Local projects may require different submittal routings, so the local public agency should be contacted for guidance.

The Prime Contractor (PC) is responsible for shop drawing accuracy and the fabrication satisfying contract requirements. Authority may be delegated to fabricators, detailers and other subcontractors. To avoid construction delays, the fabricator's detailer should send the drawings directly to the shop drawing reviewer, unless otherwise stipulated herein. To determine if the "designated reviewer" is the BBS or a consultant, please contact the BBS Shop Drawings and Fabrication Unit at (217) 558-0285.

Routing unapproved shop drawings through the PC, other subcontractors, or the Resident Engineer delays the review process and may result in the use of incorrect drawings for construction. However, the PC shall provide field verifications and coordinate activities of subcontractors, including accepting any subcontractor-proposed modifications to the contract, before shop drawings are submitted to the Engineer.

All drawings shall be completely titled according to the contract plans, including structure number, state contract number, route, section, county and shall pertain to only one structure.

Please provide these instructions and flowcharts to consultants during preliminary man-hour negotiations and to contractors at pre-construction meetings. If there are any questions concerning these guidelines, or shop drawing processes in general, please contact the Bureau of Bridges and Structures Fabrication Unit at (217) 782-3586.

Attachment

cc: Aaron A. Weatherholt; Omer M. Osman; Priscilla A. Tobias; Paul A. Loete; Maureen Addis; Tim Kell; Brian Pfeifer; Salmon Danmole
All Fabricators

Illinois Department of Transportation
Shop Drawing Requirements

A. Reviewed and approved shop drawings <u>are required</u> for the following items and shall be processed as noted:

Plate Girders
Wide Flange Beams
Miscellaneous Structural Steel
PPC Bulb-T Beams
PPC I-Beams
PPC IL-Beams
PPC Deck Beams
Precast Concrete Box Culverts
Three Sided Precast Concrete Structures
Overhead Sign Structures
Cantilever Sign Structures
Butterfly (Twin Cantilever) Sign Structures
Bridge Mounted Sign Structures
Monotube Sign Structures
Traffic Signal Mast Arms
High Mast Light Towers
Finger Plate Expansion Joints
Finger Plate Joint Trough
Modular Expansion Joints
Elastomeric Bearings
HLMR Bearings
Seismic Isolation Bearings
Fixed Bearings
Anchor Bolts
Pins and/or Link Plates
Precast Deck Planks
Precast Fascia Panels
Metal Deck Forms
Mechanically Stabilized Earth Walls
Precast Noise Walls
Prefabricated Pedestrian/Bicycle Trusses (see Item 4 below)

Other project-specific items not included in this list may also require approved shop drawings.

<u>Special Requirement Items</u>:

The Prime Contractor (PC) is responsible for the design and detailing of the following eight items. The seal and signature of an Illinois licensed Professional Engineer or Structural Engineer shall be affixed if required by the contract. The initial number and routing of supplier-prepared shop drawings (and computations if applicable) follows the attached review procedure diagrams, except as modified below. Districts should archive drawings, especially those not kept by the Bureau of Bridges & Structures (BBS).

1. <u>Mechanically Stabilized Earth Wall</u> (MSE) shop drawings and wall design computations require submittal to the BBS Bridge Design Section* and review by the BBS Geotechnical Unit, even if the shop drawings have been reviewed by a consultant. The BBS will archive shop drawings only for MSE walls that are part of bridge structures.

2. <u>Precast Concrete Box Culverts</u>, when required (reference BMPR Policy Memorandum 19-08), and <u>Three Sided Precast Concrete Structures</u> shop drawings shall be submitted directly to the BBS Fabrication Unit* for review, and two additional copies simultaneously submitted to the District Project Implementation Engineer. The District/owner shall archive shop drawings. BBS shall request distribution copies for Precast Concrete Box Culverts reviewed by this office. An electronic copy of all precast concrete box culvert shop drawings approved by the Districts, local public agencies or their consultants shall be forwarded to the BBS for this office's record and use as described in BMPR Policy Memorandum 19-08.

3. Seismic Isolation Bearing design details and computations shall be submitted to the BBS Bridge Design Section* or the design consultant, prior to the review of shop drawings. Shop drawings will not be accepted for review before the proposed designs are approved. The BBS will archive shop drawings.

4. Pedestrian/Bicycle Truss shop drawings and design computations for structures crossing over a state or federal route, or placed on an IDOT right-of-way, or having spans 150 ft. or longer, shall be submitted to the BBS Bridge Design Section* for structural review. If these structures are constructed by another governmental agency (county, municipality, park district, IL Dept. of Natural Resources, etc.), that agency is responsible for archiving the approved shop drawings for future reference.

5. Precast Noise Wall shop drawings shall be submitted directly to the BBS Bridge Design Section* for review and two additional copies simultaneously submitted to the District Project Implementation Engineer. The BBS will archive shop drawings only for the portions of noise walls that are installed on bridges.

6. "Stay-In-Place" Metal Deck Forms design calculations and shop drawings shall be submitted directly to the BBS Bridge Design Section*. The drawings will be reviewed by the BBS Fabrication Unit and BBS will archive the shop drawings.

7. Traffic Signal Mast Arm shop drawings from various manufacturers have been pre-approved by this office for specified loading configurations. The pre-approved shop drawings have been distributed to all District Project Implementation Engineers and may be used by construction personnel to accept shop drawings for loading conditions less than or equal to those that were pre-approved. For lengths or loadings that exceed pre-approved configurations, shop drawings, along with the contract signal plans, shall be submitted to the BBS Fabrication Unit* for review. Monotube Sign Structure shop drawings from manufacturers have not been pre-approved by this office, and must be submitted to the BBS Fabrication Unit* for review. The BBS will not archive final drawing records.

8. High Mast Light Tower shop drawings are to be sent to the central Bureau of Design and Environment for towers in Districts 2 through 9, and to the District 1 Bureau of Electrical Operations for towers in District 1. Luminaires, lowering devices and all electrical and mechanical components will be reviewed by those offices. Tower shop drawings and weld procedures are reviewed by the BBS Fabrication Unit* for structural details and specification conformance. The BBS will not archive final drawing records.

B. Shop Drawings for the following items need not be submitted for each project to the BBS or the review consultant, unless specified or special (non-standard) details are proposed for routine items:

Metal Railings for Bridges (Steel and Aluminum), Pedestrian/Bicycle Railing, Pre-Fabricated Inspection Platforms, Miscellaneous Items – Scuppers, Drain Piping, Navigation Lights and Mounting Hardware, Light Poles, Traffic Signal Poles and other small fabricated pieces such as embedded items for precast and pre-stressed concrete:

The fabricator shall furnish installation and detail drawings to the Contractor and Resident Engineer for field verification of locations and dimensions. These drawings shall be included in the project records. Shop fabrication inspection is not required, and the Resident Engineer's final acceptance may be based on proper fit and an overall visual inspection of the finished product.

Standard design base sheet notes require permanent tubular steel bridge traffic rail and rail posts to have Charpy-V Notch (CVN) toughness values certified by test. Test results, along with mill certification documentation, shall be submitted to the district.

CVN testing is not normally required for bicycle/pedestrian railing. All steel shall be domestic. Any paint used shall be accepted by the Bureau of Materials and Physical Research (BMPR)**. Current requirements of the BMPR concerning aluminum rail and posts shall be satisfied.

The manufacturer's maintenance instructions (periodic inspection checklists, lubrication schedules, etc.) for moveable, pre-fabricated inspection platforms shall be furnished to the Resident Engineer.

Neoprene Expansion Joints:

Each manufacturer should submit their standards to the BBS Fabrication Unit* for preapproval, thereby eliminating shop drawing review by IDOT on individual projects. The Contractor retains the responsibility for proper fit, installation and geometry, and must supply a copy of a preapproved standard to the Resident Engineer for field verification and inclusion in record drawings for the project. The BBS will not archive final drawing records.

For special, non-standard installations such as island medians, skew changes or partial replacements of dissimilar joints, shop drawings should be submitted to the BBS Fabrication Unit*.

The BMPR** will continue to receive material samples for lot testing.

Bridge Joint Sealing System (Preformed Joint Seal (PJS) or Strip Seal):

These joints' support plates are relatively simple and may be prefabricated in convenient lengths, allowing subsequent shop or field cutting to meet project requirements. Since details will be generic, no project-specific review is required, but fabricators may submit standard drawings for BBS preapproval. An installation scheme should be provided by the fabricator to the Contractor and Resident Engineer on jobs with complex geometry or multiple changes in cross slope.

When fabricators are producing the steel assemblies, the BBS Fabrication Unit * is to be notified and may verify the following: domestic material of proper grade; acceptable welding with approved procedures by qualified welders; adequate blast cleaning before painting; and proper application of an approved primer. Only one coat of primer (or optional hot-dip galvanizing) is needed and studs do not require paint.

Acceptance will be waived to the Resident Engineer at the jobsite, unless one of our fabrication inspectors is in the shop for other work and completes a BBS 59 release which includes the PJS or strip seal plates. The BMPR** will continue to lot test samples of the seal material.

Break-Away Wide Flange and Tubular Sign Posts:

Standard shop drawings from various fabricators have been pre-approved by the BBS and distributed to all District Project Implementation Engineers, and may be used by District personnel to accept shop drawings. The Contractor retains the responsibility for proper fit, installation and geometry, and must supply a copy of a preapproved standard to the Resident Engineer for field verification and inclusion in record drawings for the project. The BBS will not archive final drawing records.

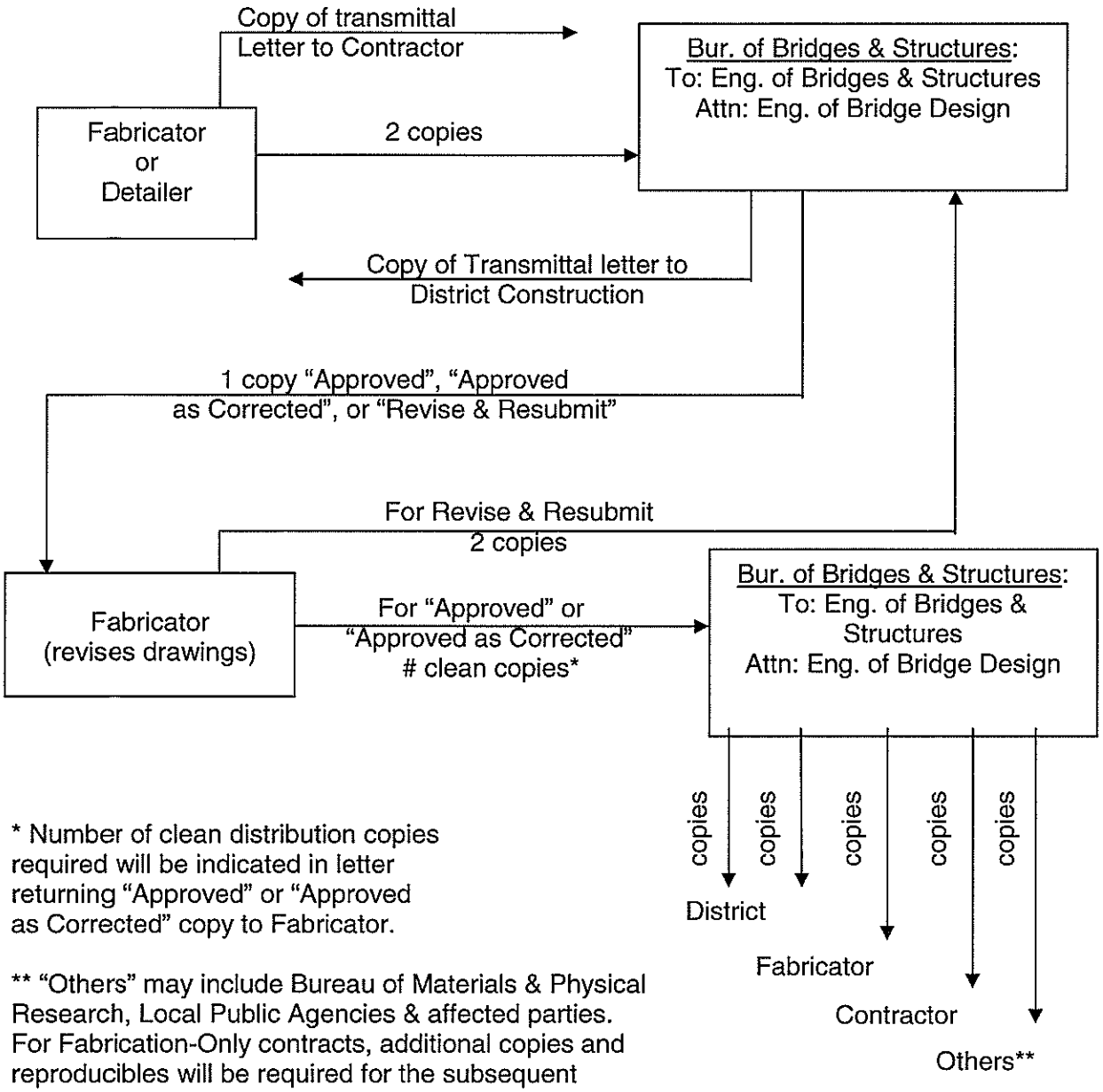
Fabric Reinforced Elastomeric Mats and Terminal Joint Wide Flange Beams:

The fabricator shall furnish installation and detail drawings to the Contractor and Resident Engineer for field verification of locations and dimensions. These drawings shall be included in the project records. Shop fabrication inspection is not required, and the Resident Engineer's final acceptance may be based on proper fit and an overall visual inspection of the finished product. The mat supplier is responsible for submitting samples to the BMPR** for lot testing.

* ILDOT Bureau of Bridges & Structures, Rm. 240,
2300 S. Dirksen Pkwy, Springfield, IL 62764:
Bridge Design Section, Fabrication Unit, or
Bridge Investigations and Repair Plans Unit, as applicable.

** ILDOT Bureau of Materials & Physical Research
126 East Ash, Springfield, IL 62704
Materials Testing Section

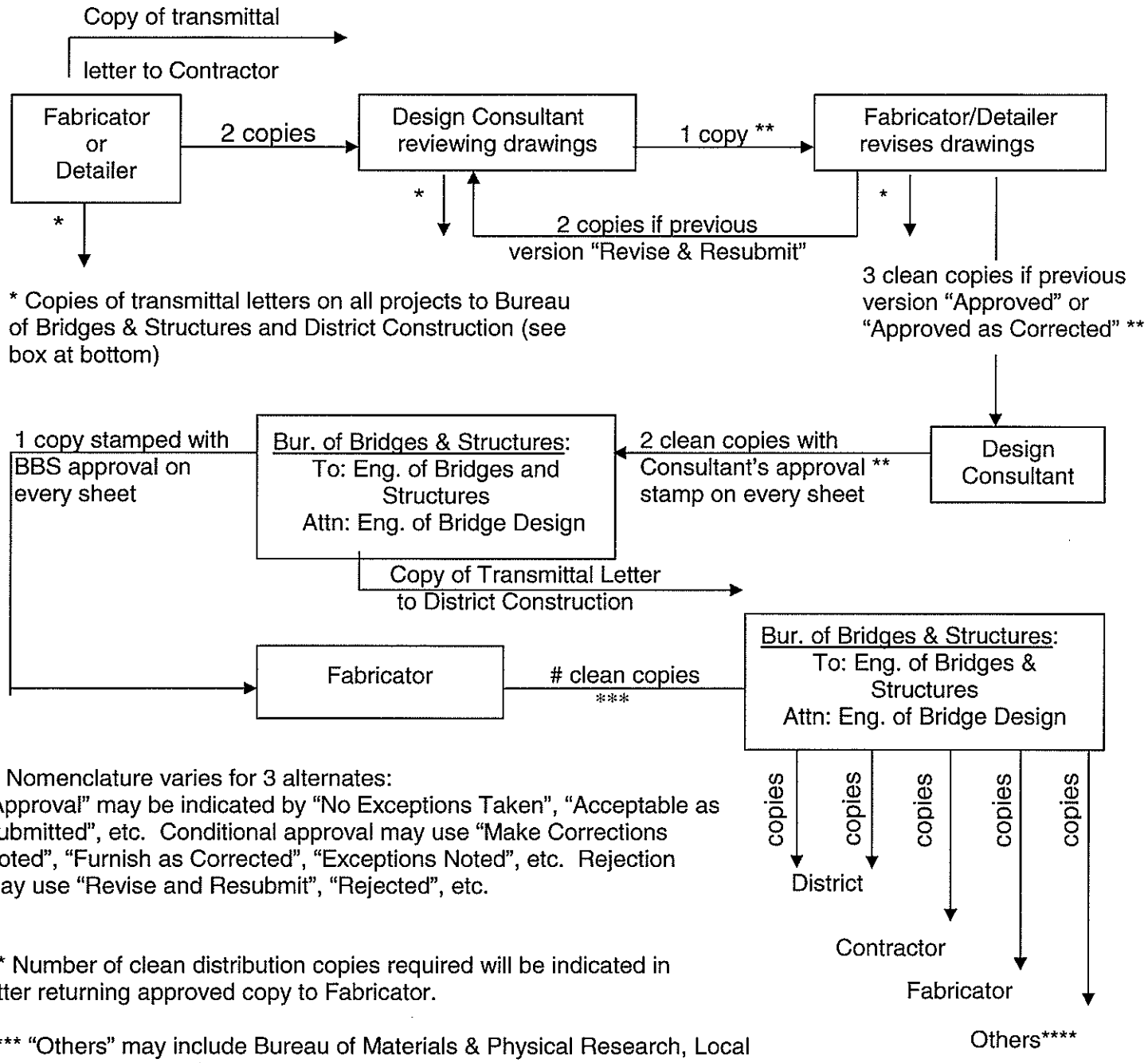
Shop Drawing Review Procedure
for Bureau of Bridges & Structures as Primary Reviewer
("Special Requirements" not included)



* Number of clean distribution copies required will be indicated in letter returning "Approved" or "Approved as Corrected" copy to Fabricator.

** "Others" may include Bureau of Materials & Physical Research, Local Public Agencies & affected parties. For Fabrication-Only contracts, additional copies and reproducibles will be required for the subsequent erection contract. Structures carrying railroads may also require reproducibles for the railroad.

Shop Drawing Review Procedure
for Design Consultant as Primary Reviewer
("Special Requirements" not included)



** Nomenclature varies for 3 alternates:
"Approval" may be indicated by "No Exceptions Taken", "Acceptable as Submitted", etc. Conditional approval may use "Make Corrections Noted", "Furnish as Corrected", "Exceptions Noted", etc. Rejection may use "Revise and Resubmit", "Rejected", etc.

*** Number of clean distribution copies required will be indicated in letter returning approved copy to Fabricator.

**** "Others" may include Bureau of Materials & Physical Research, Local Public Agencies & affected parties. For Fabrication-Only contracts, additional copies and reproducibles will be required for the subsequent erection contract. Structures carrying railroads may also require reproducibles for the railroad.

Bureau of Bridges & Structures:
To: Engineer of Bridges & Structures
Attn: Engineer of Bridge Design

District Construction:
To: Regional Engineer / Attn: District Project Implementation Engineer